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SESSION Session 1: satellite tracking and scheduling

TYPE Poster

TITLE Studying different tracking strategies to LAGEOS and Etalon with respect to the weekly ILRS solution

ABSTRACT

A tool for simulating realistic Satellite Laser Ranging (SLR) observation scenarios was developed at the Astronomical Institute of the University of Bern (AIUB). Analyzing the available measurements, a profile for each station regarding tracking density, maintenance outages, weather conditions on one hand and specific noise behavior for the different targets on the other hand was established. Unlike other studies, we focus on the tracking capabilities of the International Laser Ranging Service (ILRS) network as it is today and simulate realistic, synthetic observation scenarios considering the tracking capacity of each station. The operational ILRS standard solution, which is computed week, contains station and geocenter coordinates, as well as Earth rotation parameters (ERPs) and orbits for LAGEOS and Etalon. Based on these solution types also the contribution to the International Terrestrial Reference Frame (ITRF) is computed. Today, the solution is only based on observations to the LAGEOS and Etalon satellites with about ten times the number of LAGEOS observations compared to Etalon.

The purpose of this study is to analyze the effect of different numbers of normal points to LAGEOS and Etalon satellites on the main parameters of the ILRS standard solution. We show that in our simulation experiments that a reduction of LAGEOS observations by up to 20% does not significantly impact the quality of results. Using this spared LAGEOS tracking capability for example to increase the amount of Etalon normal points in the combined solution leads to an improvement of almost 10% in the recovery of the ERPs considering even the higher noise level and potential systematic effects in the Etalon measurements.